

**A CHEMISTRY FOR ETCHING QUATERNARY INTERFACE  
LAYERS ON InGaAsP MOSTLY FORMED BETWEEN GaAs AND  
In<sub>x</sub>Ga<sub>(1-x)</sub>P LAYERS**

5

**ABSTRACT**

A method is provided for etching quaternary interface layers of In<sub>x</sub>Ga<sub>1-x</sub>As<sub>y</sub>P<sub>1-y</sub> which are formed between layers of GaAs and InGaP in heterojunction bipolar transistors (HBTs). In accordance with the method, the interface is exposed by etching the GaAs layer with an etchant that is selective to InGaP. The interface is then etched with a dilute aqueous solution of HCl and H<sub>2</sub>O<sub>2</sub> that is selective to InGaP. The controlled etching provided by this methodology allows HBTs to be manufactured with more sophisticated, near ideal designs which may contain multiple GaAs/InGaP interfaces.

10  
15  
20  
25  
30  
35  
40  
45  
50  
55  
60  
65  
70  
75  
80  
85  
90  
95  
100  
105  
110  
115  
120  
125  
130  
135  
140  
145  
150  
155  
160  
165  
170  
175  
180  
185  
190  
195  
200  
205  
210  
215  
220  
225  
230  
235  
240  
245  
250  
255  
260  
265  
270  
275  
280  
285  
290  
295  
300  
305  
310  
315  
320  
325  
330  
335  
340  
345  
350  
355  
360  
365  
370  
375  
380  
385  
390  
395  
400  
405  
410  
415  
420  
425  
430  
435  
440  
445  
450  
455  
460  
465  
470  
475  
480  
485  
490  
495  
500